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 Relevance scale 
1 User interfaces: Management and visualization of large, complex and time-dependent 3D objects in distributed GIS

S. Shumilov, A. Thomsen, A. B. Cremers, B. Koos

 November 2002 **Proceedings of the tenth ACM international symposium on Advances in geographic information systems**

 Full text available:  pdf(856.25 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper presents solutions for architectures of distributed GIS employed for large scale geological modeling in contrast with more traditional GIS. Key technologies are proposed for dealing with complex geological spatio-temporal 3D models. These techniques are then illustrated on a prototype system developed to support interactive work on large models employed by existing geological 3D modeling tools. This prototype has already been successfully applied to the construction of large 3D and 4D ...

Keywords: 3D/4D geological modeling, CORBA, Java, VRML, VTK, animation, data selection and retrieval, distributed spatial databases, mesh decimation, open GIS, progressive transmission, temporal spatial data, visualization

2 Appearance modelling and rendering: Appearance based object modeling using texture database: acquisition, compression and rendering

R. Furukawa, H. Kawasaki, K. Ikeuchi, M. Sakauchi

 July 2002 **Proceedings of the 13th Eurographics workshop on Rendering**

 Full text available:  pdf(757.34 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

Image-based object modeling can be used to compose photorealistic images of modeled objects for various rendering conditions, such as viewpoint, light directions, etc. However, it is challenging to acquire the large number of object images required for all combinations of capturing parameters and to then handle the resulting huge data sets for the model. This paper presents a novel modeling method for acquiring and preserving appearances of objects. Using a specialized capturing platform, we fir ...

3 Modeling video objects in 4DIS temporal database system

Antonio Si, Rynson W. J. Lau, Qing Li, Hong V. Leong

 February 1998 **Proceedings of the 1998 ACM symposium on Applied Computing**

 Full text available:  pdf(808.69 KB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: data modeling, multimedia databases, object-oriented database, temporal database

a proposal for a spatiotemporal framework in XML

Alexander Zipf, Sven Krüger

November 2001 **Proceedings of the ninth ACM international symposium on Advances in geographic information systems**

Full text available: [!\[\]\(4729e517bc6a7cd81c8025b9646574fb_img.jpg\) pdf\(1.75 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

XML is nowadays a commonly used way for describing and exchanging data. Within the GIS community the OpenGIS Consortium (OGC) recently has published the Geographic Markup Language (GML) as a new specification [8]. GML is essentially an XML encoding of the Simple Feature Specification (SFS). A range of further XML-based standardization efforts by the OGC are under development right now. But it is known that spatial features do not only have geometric or thematic properties, but also temporal aspe ...

Keywords: GIS, XML-schema, databases, geographic markup language (GML), spatio-temporal models

5 4DIS: a temporal framework for unifying meta-data and data evolution

Antonio Si, Hong V. Leong, Peter Y. Wu

February 1998 **Proceedings of the 1998 ACM symposium on Applied Computing**

Full text available: [!\[\]\(5361750c22c4e047a52f4eac1ec2d4cc_img.jpg\) pdf\(913.11 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: data modeling, database design, object-oriented database, temporal database

6 Spatial Database Clustering: New methods for topological clustering and spatial access in object-oriented 3D databases

M. Breunig, A. B. Cremers, W. Müller, J. Siebeck

November 2001 **Proceedings of the ninth ACM international symposium on Advances in geographic information systems**

Full text available: [!\[\]\(7d1d6890825e83a6a4a51febe2dcc7f3_img.jpg\) pdf\(1.71 MB\)](#) Additional Information: [full citation](#), [abstract](#), [index terms](#)

The data handling component of today's geographical information systems still only considers the management of two-dimensional data. However, in the geosciences as well as in commercial planning fields there is an increasing need to manage large amounts of 2.5D- and 3D-data. On the one hand, mobile telephony providers require digital landform data to maintain overall communication service networks. On the other hand, geoscientists and engineers need 3D surface and solid data to research dynamic ...

Keywords: 3D, GeoToolKit, geo-database, spatial access algorithms, spatial clustering

7 Archiving, digital collections, and analysis: A work-flow and data model for reconstruction, management, and visualization of archaeological sites

Stefan Hynst, Michael Gervautz, Markus Grabner, Konrad Schindler

November 2001 **Proceedings of the 2001 conference on Virtual reality, archeology, and cultural heritage**

Full text available: [!\[\]\(aff7c69c44a5e015f18c35867ef3f5c3_img.jpg\) pdf\(565.94 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We propose a framework for a complex visualization environment suitable for archaeological applications. Given 2D and 3D data derived from appropriate acquisition processes, the scene is organized in a structure that can easily be incorporated into a database. Special care is taken on attributes such as time and likelihood of scientific hypotheses which are important for a correct interpretation of the excavation site. After a preprocessing step, the database content can directly be used to vis ...

Keywords: 3D database, 3D reconstruction, multiresolution, virtual environments, visualization

8 Approximate spatio-temporal retrieval

This paper proposes a framework for the handling of spatio-temporal queries with inexact matches, using the concept of relation similarity. We initially describe a binary string encoding for 1D relations that permits the automatic derivation of similarity measures. We then extend this model to various granularity levels and many dimensions, and show that reasoning on spatio-temporal structure is significantly facilitated in the new framework. Finally, we provide algorithms and optimization ...

9 Image-based transparency and refraction: Acquisition and rendering of transparent and refractive objects

Wojciech Matusik, Hanspeter Pfister, Remo Ziegler, Addy Ngan, Leonard McMillan

July 2002 **Proceedings of the 13th Eurographics workshop on Rendering**

This paper introduces a new image-based approach to capturing and modeling highly specular, transparent, or translucent objects. We have built a system for automatically acquiring high quality graphical models of objects that are extremely difficult to scan with traditional 3D scanners. The system consists of turntables, a set of cameras and lights, and monitors to project colored backdrops. We use multi-background matting techniques to acquire alpha and environment mattes of the object from mul ...

10 Concurrent compacting garbage collection of a persistent heap

James O'Toole, Scott Nettles, David Gifford

December 1993 **ACM SIGOPS Operating Systems Review , Proceedings of the fourteenth ACM symposium on Operating systems principles**, Volume 27 Issue 5

We describe a replicating garbage collector for a persistent heap. The garbage collector cooperates with a transaction manager to provide safe and efficient transactional storage management. Clients read and write the heap in primary memory and can commit or abort their write operations. When write operations are committed they are preserved in stable storage and survive system failures. Clients can freely access the heap during garbage collection because the collector concurrently builds a comp ...

11 Reverse engineering: a roadmap

Hausi A. Müller, Jens H. Jahnke, Dennis B. Smith, Margaret-Anne Storey, Scott R. Tilley, Kenny Wong

May 2000 **Proceedings of the conference on The future of Software engineering**

Keywords: data reverse engineering, program comprehension, program understanding, reverse engineering, software analysis, software engineering, software evolution, software maintenance, software migration, software reengineering, software tools, tool adoption, tool evaluation

12 Strategic directions in constraint programming

Pascal Van Hentenryck, Vijay Saraswat

December 1996 **ACM Computing Surveys (CSUR)**, Volume 28 Issue 4

13

Interaction in the real world: The missing link: augmenting biology laboratory notebooks

Full text available:  pdf(814.78 KB)

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Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Using a participatory design process, we created three prototype augmented laboratory notebooks that provide the missing link between paper, physical artifacts and on-line data. The final *a-book* combines a graphics tablet and a PDA. The tablet captures writing on the paper notebook and the PDA acts as an "interaction lens" or window between physical and electronic documents. Our approach is document-centered, with a software architecture based on layers of physical and electronic informat ...

Keywords: SVG, *a-book*, augmented laboratory note-books, augmented reality, information layers, interaction lens, interactive paper

14 A study on data point search for HG-trees

Joseph Kuan, Paul Lewis

March 1999 **ACM SIGMOD Record**, Volume 28 Issue 1

Full text available:  pdf(562.95 KB) Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

A point data retrieval algorithm for the HG-tree is introduced which improves the number of nodes accessed. The HG-tree is a multidimensional indexing tree designed for point data and it is a simple modification from the Hilbert R-tree for indexing spatial data. The HG-tree data search method mainly makes use of the Hilbert index values to search for exact data, instead of using conventional point search methods as used in most of the R-tree papers. The use of Hilbert curve values and MBR c ...

Keywords: algorithm, databases, information retrieval

15 The CCUBE constraint object-oriented database system

Alexander Brodsky, Victor E. Segal, Jia Chen, Paval A. Exarkhopoulos

June 1999 **ACM SIGMOD Record, Proceedings of the 1999 ACM SIGMOD international conference on Management of data**, Volume 28 Issue 2

Full text available:  pdf(360.96 KB) Additional Information: [full citation](#), [citations](#), [index terms](#)

16 Can Datalog be approximated?

Surajit Chaudhuri, Phokion G. Kolaitis

May 1994 **Proceedings of the thirteenth ACM SIGACT-SIGMOD-SIGART symposium on Principles of database systems**

Full text available:  pdf(1.27 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In this paper, we investigate whether recursive Datalog predicates can be approximated by finite unions of conjunctive queries. We introduce a quantitative notion of error and examine two types of approximation, namely, absolute approximation and relative approximation. We also stipulate that the approximations obey certain qualitative criteria, namely we require them to be upper envelopes or lower envelopes of the Datalog ...

17 DOLORES: a system for logic-based retrieval of multimedia objects

Norbert Fuhr, Norbert Gövert, Thomas Rölleke

August 1998 **Proceedings of the 21st annual international ACM SIGIR conference on Research and development in information retrieval**

Full text available:  pdf(1.69 MB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

18 Synthesizing bidirectional texture functions for real-world surfaces

Full text available:  pdf(4.30 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In this paper, we present a novel approach to synthetically generating bidirectional texture functions (BTFs) of real-world surfaces. Unlike a conventional two-dimensional texture, a BTF is a six-dimensional function that describes the appearance of texture as a function of illumination and viewing directions. The BTF captures the appearance change caused by visible small-scale geometric details on surfaces. From a sparse set of images under different viewing/lighting settings, our approach g ...

Keywords: bidirectional texture functions, image-based rendering, photometric stereo, reflectance and shading models, shape-from-shading, texture synthesis

19 [A retrieval technique for similar shapes](#) 

H. V. Jagadish

April 1991 **ACM SIGMOD Record , Proceedings of the 1991 ACM SIGMOD international conference on Management of data**, Volume 20 Issue 2

Full text available:  pdf(1.04 MB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

20 [Time dilation visualization in relativity](#) 

Ping-Kang Hsiung, Robert H. Thibadeau, Christopher B. Cox, Robert H. P. Dunn

November 1990 **Proceedings of the 1990 ACM/IEEE conference on Supercomputing**

Full text available:  pdf(2.20 MB) Additional Information: [full citation](#), [abstract](#), [references](#)

This work extends our previous effort in visualizing the spatial aspect of relativistic effects, and treats the phenomenon of time dilation; an inherent temporal effect of special relativity. Here, we demonstrate through still-frame images and live animations that in observing the viewing independent time dilation, the finite light transit time involved in performing the observation makes the observed time dilation also depend on the viewing condition. As we introduce the physics of ...

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JNL = Journal or Magazine **CNF** = Conference **STD** = Standard**1 A unified visualization framework for spatial and temporal analysis in 4D GIS**

Sung-Soo Kim; Seong-Ho Lee; Kyong-Ho Kim; Jong-Hun Lee;
Geoscience and Remote Sensing Symposium, 2003. IGARSS '03. Proceedings.
2003 IEEE International, Volume: 6 , 21-25 July 2003
Pages:3715 - 3717 vol.6

[Abstract] [\[PDF Full-Text \(1458 KB\)\]](#) **IEEE CNF**

2 4D visualization of highway construction projects

Liapi, K.A.;
Information Visualization, 2003. IV 2003. Proceedings. Seventh International Conference on , 16-18 July 2003
Pages:639 - 644

[Abstract] [\[PDF Full-Text \(643 KB\)\]](#) **IEEE CNF**

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Silver, D.;
Computer Graphics and Applications, IEEE , Volume: 15 , Issue: 3 , May 1995
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[Abstract] [\[PDF Full-Text \(1172 KB\)\]](#) **IEEE JNL**

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Kuroki, S.; Makinouchi, A.; Ishizuka, K.;
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Pages:142 - 147

[Abstract] [\[PDF Full-Text \(428 KB\)\]](#) **IEEE CNF**

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Lee, D.J.Y.; Basmaji, M.;
Vehicular Technology Conference, 2002. Proceedings. VTC 2002-Fall. 2002 IEEE 56th , Volume: 2 , 24-28 Sept. 2002

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Newton, C.;

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Balovnev, O.; Breunig, M.; Cremers, A.B.; Pant, M.;

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Siebeck, J.; Shumilov, S.; Cremers, A.B.; Breunig, M.; Thomsen, A.;

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12 4D flight guidance displays, a gate to gate solution

Kubbat, W.J.; Lenhart, P.M.; Von Viebahn, H.;

Digital Avionics Systems Conference, 1998. Proceedings., 17th DASC. The AIAA/IEEE/SAE , Volume: 1 , 31 Oct.-7 Nov. 1998

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15 Evaluation of automatic 4D face recognition using surface and texture registration

Papatheodorou, T.; Rueckert, D.;
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